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HANDBOOK

OF THE

6-pounder

HOTCHKISS QUICK-FIRING GUN.



1892.



LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE.
BY HARRISON AND SONS, ST. MARTIN'S LANE,
PRINTERS IN ORDINARY TO HER MAJESTY.

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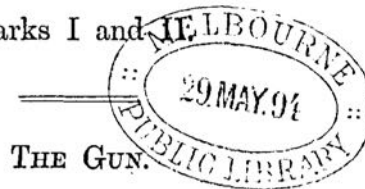
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NOTE.—This handbook is correct up to April, 1892. Any alterations which may be suggested should be forwarded to Assistant to Director of Artillery, Woolwich.

Hotchkiss 6-pr. Quick-firing Guns.

Marks I and



THE GUN.

Nomenclature.

(Plate I.)

- (1) Tube; (2) jacket; (3) locking ring; (4) wedge.
 (5) Chase; (6) reinforce; (7) breech; (8) trunnion arms; (9) trunnion shoulders; (10) fore sight arm.
 (11) Rifled bore; (12) shot chamber; (13) rotating band chamber;
 (14) powder chamber; (15) wedge mortise; (16) wedge guides;
 (17) extractor guide.
 (Right side) Crank Journal; (left side) shoulder-piece fixing screw seat; screw stop wedge seat, stud, steadying, shoulder-piece seat; (bottom) trigger-guard or trigger-bracket screw holes.

(Plate II.)

- (18) Crank; (19) crank stud; (20) crank stud groove; (21) crank handles; (23) screw stop wedge; (24) stop screw groove; (25) wedge plate
 (26) Hammer; (27) firing pin; (28) rocking shaft; (28a) re-cocking lever; (29) main spring; (30) main spring stirrup; (31) main spring rest; (32) trigger sear; (33) trigger sear spring; (34) trigger; (35) cock notch; (36) cocking toe; (37) cocking cam; (38) trigger guard.
 (39) Extractor; (41) extractor stud; (42) extractor stud groove.

(Plate III.)

- (43) Shoulder piece fixing screw; (44) stud, steadying, shoulder-piece; (45) shoulder-piece buffer tube; (46) shoulder-piece handles; (47) deflector.
 (48) Fore sight; (49) tangent sight; (50) clamp tangent sight; (52) sliding leaf; (53) deflection screw.

(7745)

A 2

(54) Oil can; (55) tommy for dismounting; (56) screw driver; (57) hand extractor for cartridge; (58) drill hook; (59) cleaning brush; (60) sponge brush with rod.

Mark II gun differs from *Mark I* in being fitted for a recoil mounting. For this purpose the shoulder piece and trigger-guard are removed from the gun, a trigger-bracket fitted with a trigger-piece being substituted for the trigger-guard. The crank handle is also of a different shape as shown in Plate VI.

Description.

The body of the Hotchkiss 6-pounder quick-firing gun consists of three pieces of oil-tempered steel; the tube extending from the face of the muzzle to the front face of the wedge, comprising the whole length of bore; the jacket, which is shrunk over the rear part of the tube and which carries both the trunnions and the wedge; the locking ring, a screwed collar connecting the tube and jacket, and which carries the foresight. By this construction the tube bears the main transverse strains, the jacket bears all the longitudinal strains, the locking ring ensures against the displacement of the tube and jacket.

The bore is rifled with a right-handed increasing twist. The lands are very narrow in proportion to the grooves, and are twenty-four in number.

The wedge is a square hollowed steel block with rounded corners, having a vertical movement in a mortice cut completely through the jacket. The front face of the block is perpendicular to the axis of the bore, whilst the rear face is slightly inclined. The front upper corner is cut back to allow free movement to the extractor. In the hollowed part of the block is contained the firing mechanism.

That part of the front face of the wedge which covers the bottom of the bore consists of a hard steel plate, dovetailed into the face of the block and secured by two screws. The plate is fitted with a removable steel bush, through which the firing hole passes.

By the movement of the wedge the breech is opened or closed, the empty cartridge case is extracted, and the firing mechanism is cocked.

The wedge is moved and also held fast when closed by the crank, which has a small stud (19) at its end travelling in a groove (20) in the wedge. The crank is journalled in the right cheek of the breech, and carries on its stem the crank handle (21) furnished with a small spring catch to hold the breech closed.

The hammer is mounted in the middle line of the wedge, and carries a removable firing pin (27), which acts on the primer of the cartridge through the firing hole in the bush of the wedge plate. It is mounted on a rocking shaft (28), which has a toe (36) on the outside of the breech. When the crank is turned to lower the block, a cam (37) formed on the crank handle mounted on the crank stem is brought against the toe of the rocking shaft, thus throwing the hammer back and cocking it.

Fitted to the under side of the rocking shaft is a lever (28a), by means of which the gun may be re-cocked in case of a missfire, without opening the breech.

The hammer is held at a full cock by means of a trigger-sear actuated by a spring (33), both being secured in the bottom of the wedge. The end of the sear catches in a cock notch (35) on the axis of the hammer.

A loose trigger is carried in a trigger-guard (38) secured to the rear of the breech; when the wedge is closed this trigger is brought in contact with the sear, so that by pulling it the sear is pressed down until its end slips clear of the cock-notch, allowing the hammer to fly forward and fire the gun.

The Mark II gun is provided with a bracket carrying a trigger-piece in place of the trigger-guard and trigger, the gun being fired by the trigger-piece engaging the trigger, the latter forming part of the mounting, instead of being attached to the gun itself, as in Mark I.

The main spring is double branched, and is so fitted as to make both of its branches work on the hammer on opposite sides of the axis of rotation, thus gaining the full power of the spring with almost frictionless rotation. One branch of the spring lies in a rest (31) on one side of the axis, and the other end hangs in a stirrup (30) on the other side. This stirrup also holds the rocking shaft in place.

The extractor is a single piece of steel working in a longitudinal groove (17) in the left cheek of the breech. Its forward end is shaped into a hook to engage the head of the cartridge. On the same side of the extractor as the hook is a small stud (41), which travels in a groove (42) in the wedge, thus giving motion to the extractor.

The shoulder-piece in Mark I gun is attached to the left side of the gun by three fastenings: the screw stop wedge (23), the shoulder-piece fixing screw (43), and the stud steadying shoulder-piece (44). On the vertical arm of the shoulder-piece is fixed a buffer (45) of rubber tubing, which prevents the shock of discharge being felt by the gunner. The lower end of the arm is provided with handles (46) to facilitate holding the piece. In order to prevent the extracted cartridge cases from falling on the feet of the gunner, a deflector (47) is attached to the arm of the stock.

In Mark II gun the shoulder-piece is not attached to the gun.

When the wedge is run down, it is prevented from dropping clear out of its mortice by a screw stop-wedge (23), screwed through the left cheek of the breech, its end projecting into a groove (24) in the left face of the wedge.

The trigger-guard of Mark I gun, secured to the right lower side of the breech, carries the trigger (34), and also aids in holding and handling the gun.

In the case of the Mark II gun the trigger-guard is replaced by a bracket carrying a trigger-piece, with which the trigger attached to the mounting engages.

The fore sight (48) is a plain roughened steel point, but for the coaling stations the guns are fitted with speed sights. The tangent sight (49) is a bar sight worked by a rack and pinion (51), and graduated to hundreds of yards. It carries a sliding leaf (52), giving 2° deflection right and left.

The gun is full sighted; that is, for exact aim the point of the fore sight must be brought in line with the top edge of the sight notch.



The Action of the Mechanism.

The gun having been fired, the action of the mechanism in reloading is as follows:—

The breech is opened by pulling the crank handle to the rear. As the crank handle commences to move, the crank stud is carried backward in the part of its groove which is concentric with the axis of the crank, therefore the wedge does not move; during this time the cocking cam acts on the cocking toe and cocks the hammer. The crank stud passing on into the inclined part of its groove, the wedge commences to descend. The extractor, actuated by the movement of the block, commences to move very slowly back with a powerful leverage, starting the cartridge case from its seat. When the wedge has descended so far as to unmask the bore, the change in direction of the extractor stud groove causes the extractor to take a quick violent motion to the rear, throwing the cartridge case entirely out of the gun. The wedge is at this point stopped in its descent by the stop screw.

The gun is ready for loading.

The new charge having been entered in the chamber, is pushed home until the head of the case takes against the hook of the extractor; the wedge is closed by a reverse movement of the crank handle. As the wedge rises, its inclined upper corner pushes the cartridge and extractor close home. When the wedge is entirely up, its face bears tightly against the head of the cartridge, and the crank has passed the vertical position and rests against the body of the gun, so that the wedge is held secure in three ways: by its own weight pressing on the crank past the centre, by the reaction of the crank and handles in firing, and by a small spring catch.

When the breech is closed the cocking cam is in position to allow the cocking toe, and with it the hammer, to act in firing. The top branch of the trigger also rests against the sear. On pulling the trigger its top branch presses down upon the sear, releases it from the cock-notch, and the hammer flies forward striking the primer of the cartridge.

In case of a missfire the gun may be re-cocked without opening the breech by means of the re-cocking lever.

It is impossible to fire the gun before the breech is entirely closed, for three reasons, viz.: The firing pin is not in line with the primer; the trigger will not act on the sear; the cocking toe will catch on the cocking cam before the firing pin can touch the primer.

It is impossible to bring a shock on the cartridge primer in closing the breech, as the face of the wedge *slides along* the head of the cartridge, thus giving perfect security in loading and unloading.

The Drill Hook.

Plate IV.

The drill hook is designed to relieve the mechanism from strain when snapping the gun at drill. Plate IV, Fig. 3, clearly shows the manner of application. At drill, or when the piece is secured, the drill hook should remain in place, but when the gun is cast loose for action, *remove the drill hook, and hook the lower branch of the spring to the stirrup*; otherwise a missfire may occur.

Directions for Mounting and Dismounting the Mechanism.

With Mark I gun, turn the screw stop wedge (23) and the fixing screw (43) a quarter turn with the dismounting tool; the shoulder-piece is then loose, and will come off the gun.

With either gun, the breech being closed, partially unscrew the stop screw (23) by backing it about four turns. Start the crank handle back and ease the block down out of its guides, holding it with the hands as it comes out of the mortice.

The mechanism may be dismantled with the wedge either in or out of the gun. *First uncock the hammer*; if the wedge is closed and the gun not loaded, this will be done by pulling the trigger; if the breech is open or the wedge is out of the gun, it will be done by pressing down on the sear.

Insert the point of the screw-driver in the seat of the bend of the main spring (Plate IV, Fig. 2), so that the fulcrum side of the blade of the screw-driver will be flat on the branch of the spring; press down and slip the stirrup (30) off the end of the spring. Take out the main spring. Turn the stirrup to a horizontal position, so as to unlock the rocking shaft (28). Pull out the rocking shaft and remove the hammer.

With the point of the screwdriver, back out the sear spring, which is dovetailed in its seat. (Plate IV, Fig. 1.)

Take off the sear.

Take out the keep screw in the hub of the crank handle and pull the latter off the stem of the crank. Take out the crank.

Withdraw the extractor from its groove.

Proceed in the reverse way in mounting: *the hammer must be at full cock when inserting the rocking shaft.*

For instructions for guidance in the service of the gun, see page 17.

Care and Preservation.

The guns require no special care beyond that of being kept clean, free from rust, and undefaced.

Gritty substances must never be used on any part of the gun.

The parts of the mechanism must never be scraped with knives or metal, or be defaced or roughened in any way.

All parts of the gun must be kept covered with anti-corrosive composition as a protection from rust.

Always after firing the gun should be thoroughly cleaned. To do this, dismount the mechanism completely and wash every part thoroughly with warm fresh-water soap suds; mechanism, wedge, mortice, and barrel should all be treated alike.

After thoroughly scrubbing all parts, dry them carefully and let all stand for a short time to air and dry off the moisture.

After drying, cover all parts with anti-corrosive composition.

Mount the mechanism.

Keep the gun covered whenever there is a chance of getting grit or salt water on it.

Respect and re-cover with composition, if necessary, once a quarter. In re-coating with composition always first wipe off the old which has become clogged with dust and grit.

After drill or practice, always ease springs: the gun should never be left cocked.

When the wedge is removed from the gun for storage purposes, the main spring should be slackened by pressing it down and releasing the stirrup which retains it in tension.

Dimensions.

Diameter of bore between lands	in.	2.244
" " " grooves	"	2.268
Equivalent diameter of cross-sections	"	2.256
Maximum " powder chamber	"	2.709
Length of bore in calibres	"	40
Distance from bottom of bore to base of shell	"	10.07
Total length of gun	"	97.63
Extreme length, including shoulder-piece	"	118.89 Mark I gun.
Length of rifled bore	"	76.91
Number of grooves	"	24
*Angle of rifling	deg.	1 to 6
Diameter of trunnions	in.	3.346
Distance between shoulders of trunnions	"	9.252
Axis of trunnions from face of breech	"	24.80
Radius of sights	"	37.16
Weight of wedge	lb.	50
Weight of shoulder-piece	"	28 Mark I gun.
Total weight of gun (without shoulder-pieces	"	821 (7cwt. 1qr. 9lb.)

* Twist of rifling. Increasing from 1 in 180 at breech end of rifling to 1 in 29.89 at 9.98 inches from muzzle. Remainder uniform 1 in 29.89.

Non-Recoil Mounting.

Plate V.

Nomenclature.

(A) Capsquares. (B) Screws, capsquare. (C) Lever, clamping. (D) Screw, holding-down pivot. (E) Pivot. (F) Socket. (G) Stand, elastic. (H) Shield. (I) Stays, shield. (J) Screw, holding-down socket. (K) Collar, friction.

Description.

The gun is supported by its trunnions in a fork-shaped gunmetal pivot (E), provided with capsquares. These capsquares are secured by four screws, by means of which the bearings are made to fit the trunnions closely, and thus the shock of recoil and consequent damage to the metal of the pivot is avoided. The gun has no tendency to alter its elevation on discharge, and an elevating screw can be dispensed with. The rear right hand screw is provided with a clamping lever (C). The capsquares are not provided with lugs, but have flat surfaces to allow of the movement required for clamping and for ready adjustment on the trunnions. The pivot fits into a gunmetal socket (F) and is free to revolve about a vertical axis, but is prevented from lifting by a holding-down screw (D); its weight with that of the gun being taken on steel collar (K). The weight of the gun, pivot, and socket is taken by a flange round the top of the socket, which rests on the bush of the elastic stand. A circular

groove round the bottom of the socket forms a bearing for the ends of holding-down screws (J), which hold it firmly down to the elastic stand.

The elastic stand (G) consists of a gunmetal bush which receives the pivot, and to which are fitted and bolted eight iron legs; these diverge and are connected at the bottom by a D-shaped base ring. The stand is made of this shape to admit of its being fixed close up to an embrasure or rail; it is of such a height as to give the gunner an easy position in aiming. An iron band is shrunk over the bush and upper part of the legs so as to bind the whole firmly together. Through two of the legs and through the bush pass screws, mentioned above, which engage the groove in the socket and prevent it rising.

The lower part of the shield fits into recesses in the pivot, where it is secured by wedges, tightened by set screws. The upper part is supported by two stout iron stays which fit into sockets in rear of the trunnion bearings, and are secured there by split keys. Sufficient metal is cut away to admit of the gun being elevated to 18° or depressed to 30° . The shield moves with the gun, completely covering the operator, and, by its inertia, relieves the base ring of a portion of the strain due to recoil.

The whole of the laying is effected by the gunner, who, with his shoulder pressed against the shoulder-piece on the gun, and his right hand on the pistol grip, has full control over the movement of the gun in either a horizontal or vertical plane.

	<i>Weight.</i>			ewt.	qrs.	lbs.
Pivot and socket	4	2	11
Shield	1	2	0
Elastic stand	7	0	0
				13	0	11

Recoil Mountings.

Plates VI and VII.

The carriage is constructed to allow of 20° elevation and 20° depression being given to the gun. It consists of a sliding crosshead to which the gun is secured by capsquares, a cradle with hydraulic buffers to check recoil, a pivot to carry the cradle, a shoulder-piece, and a trigger-guard.

The sliding crosshead is a gunmetal casting with bearings for the trunnions of the gun, grooves to allow it to slide on recoil along guides on the cradle, and lugs to which the piston rods of the hydraulic buffers are attached.

The cradle (a) is of cast steel, provided with trunnions, which are supported in bearings on the steel pivot (b). The rear ends of the guides on the cradle are connected by a gunmetal casting, from which two arms project, the one on the right to take the pistol grip and trigger-guard (c), and the one on the left the shoulder-piece (d). Elevating and traversing are effected by the man laying, who with his shoulder pressed against the shoulder-piece, and his right hand on the pistol grip, has full control over the movements of the gun. On firing there is no blow or strain on the shoulder, and the gun returns at once to the firing position without any shock or rebound. Two hydraulic buffers (e) are formed in the cradle, and are fitted

with caps, glands, piston rods, and packing leathers. These buffers are connected by a passage for the fluid, in order to equalize the pressure. The piston rods are attached to the sliding crosshead, and pass through the glands of the buffer. On each piston rod inside the cylinder a spiral spring is placed, which is compressed during recoil, and by its reaction brings the gun to the firing position. The cylinders are each fitted with two metal strips varying in thickness, and ports are cut in the pistons for the flow of the liquid, which varies during recoil; by this means an approximately constant pressure is maintained in the buffers during recoil, which is about 4 inches. Small springs fixed to the buffers engage with the glands, and prevent their working loose. Below the buffers is an automatic arrangement, which consists of a cylinder fitted with a ram, gland, and U-leather. This cylinder is connected to the buffer cylinder, and on recoil the liquid forces the ram against a groove formed on the pivot, and acts as a brake to prevent the altered position of the weights on recoil throwing the gun out of elevation or causing strain on the shoulder.

The steel pivot (*b*) is fork-shaped at the top end, and provided with bearings to take the cradle trunnions which are secured by capsquares and set screws; the lower end of the pivot is grooved to receive the end of a clamping screw (*f*), which passes through the metal socket, and secures the pivot in position when required.

The shoulder-piece (*d*) is a gunmetal casting, with the part of the stock against which the shoulder rests padded with indiarubber.

Embrasure.

The gunmetal socket, in which the mounting works horizontally, is provided with a clamping screw (*f*) for securing the pivot. It is attached by bolts to a cast-steel saddle, which is fixed to the sill of the embrasure by wedges and set screws.

The shield* (*g*) is bolted to the steel pivot (*b*), and is made of $\frac{3}{16}$ -inch steel curved at the sides.

Cone.

The cone is built up of steel plate and angle steel pieces, and fitted with a gunmetal socket at the top to take the mounting.

The shield* (*g*) is of $\frac{3}{16}$ -inch steel plate, curved at the sides and top, and bolted to the pivot (*b*).

	cwt.	qrs.	lbs.
Total weight of gun and mounting (without shield and socket)	13	2	3
Total weight recoil carriage, without shield	6	1	14
„ of socket for embrasure	2	0	22
Total weight of shield for cone	1	2	3
„ of shield for embrasure	1	0	6
Mean height of trunnions, embrasure above sill			22.55 inches.
Ditto, cone	43	435	„

* Ports are cut on the right side of the shield to suit the sighting of the gun.

Instructions for Care and Preservation of the Mountings.

Care must be taken that all working parts are well lubricated, and kept free from clotted grease, dirt and rust.

A leakage from the hydraulic buffers must be immediately stopped by tightening up the gland or cap where the leakage occurs; care being taken to disengage the securing spring from the notch before turning the gland, and afterwards to engage it in its new position. If "tightening up" will not stop the leakage, the leather packing must be replaced.

To replace the gland "U" leather packing.—Unscrew the plugs and empty the buffers, unscrew the caps from the cylinders and the piston rods from the sliding cross-head; then disengage the securing spring, unscrew the gland, and replace the leather. In screwing up the piston rods, great care must be taken to place the ports of the piston exactly opposite the metal strips of the cylinder. When screwed up the piston rods will not be in correct position unless the ends are flush with the face of the sliding cross-head, with the marks stamped on the piston rod and cross-head, exactly opposite each other. The removal or replacing of the caps will be facilitated if a handspike be inserted between the pivot and the cross-head, and force the latter in, and thus relieve the caps from the pressure of the springs.

To replace the brake gland "U" leather packing.—Empty the buffers, dismount the cradle, remove the gland and take out the ram.

Great care should be taken in putting in a "U" leather to see that the edges enter properly without being damaged. If from remaining long in store the leathers become at all shrunk, they should be placed in luke-warm water to expand them before they are put into the mounting.

To replace leather packing of cap.—Empty the buffers, unscrew the cap (in the manner described above) and fit in a new leather.

Before firing the buffers must be quite full.—(See instruction plate on the mounting.)

AMMUNITION.

Steel Shell, Mark III (*Plate VIII*).

Common Shell, Mark II.

Practice, Mark II (*Plate IX*).

Saluting, Mark II (*Plate X*).

Dummy Drill, Mark I.

These guns are supplied with fixed ammunition, which is obtained by contract complete, or made in the Royal Laboratory.

The *Cartridge, Quick-firing, 6-pr. Shell, Mark III*, with steel shell fuze, consists of a capped cartridge case, with charge, wad, and steel shell, filled with powder, and fuze.

The case is of solid drawn brass, about 12 inches long, with the body slightly tapering, and with a rim at the base for extracting it. It is varnished inside, and has a hole in the base to contain the cap chamber. The latter is made of brass, raised in the middle to form an anvil, round which there are three fire holes. The cap is of copper, .05 inch thick, containing detonating composition, covered with tin-foil, and is fixed in the cap chamber by the metal of the latter being spun over it. Some cases of a former pattern have a central tube about 3 inches long, primed with F.G. powder to facilitate ignition

A brass safety clip, with pad of felt in Mark II, or india-rubber in Mark I, covers the cap to protect it, and is not to be removed, except for inspection, until just before loading. The Mark III clip has no pad, but protects the cap by a strong central dome.

The charge consists of 1 lb. 15 oz. Q.F.¹ powder, over which is placed one or more 2-inch felt wads. The shell is made of forged steel with a band in front and a groove about $1\frac{1}{2}$ inches from the base to receive the driving band. The base is reduced slightly in diameter to facilitate insertion in the case. The head is formed to a radius of nearly three diameters, and brought to a point. The base is closed by a mild steel base piece, screwed 12 threads per inch left hand. Shell may, however, be supplied with a solid base. The centre of the base piece is bored and tapped 12 threads per inch left hand to receive the fuze. The shell is fitted with a copper Vavasseur driving band, with two cannelures, pressed into the groove round the shell. The interior of the shell is lacquered or varnished, and is filled with 4 oz. of fine grain powder.

The shell, except the driving band, is painted black, with a white band .5 inch wide, 1 inch from the point.

The shell is pressed into the case until the latter touches the driving band, and is fixed by three indentations of the case into a groove round the shell a little above the base.

The fuze may be either the Nordenfelt or the Hotchkiss, Mark II, pattern (Plate XI).

The former consists of a metal body screwed 12 threads per inch left hand, with a percussion pellet, split safety collar, and screwed cap with needle.

The percussion pellet is made of metal, with a recess at the top, containing two grains of detonating composition, covered with a thin brass disc, over which the edge of the recess is spun. The safety collar is of metal, split down one side, and having the upper portion of a smaller internal diameter than the lower, which fits over the pellet. The needle is of steel, and is fixed in the screwed cap, which closes the end of the fuze. Two fire holes are bored through the cap, and are primed with pressed powder, the inner face of the cap being covered with muslin, and the outer with waterproof paper.

On the shock of discharge, the collar sets back over the pellet, and on impact collar and pellet fly forward together against the needle, which pierces the detonator and fires the fuze.

The Hotchkiss fuze consists of a maganese-bronze body, screwed 12 threads to the inch left hand, with a percussion pellet and a gun-metal cap and plug containing the detonating cap. The detonator is inserted from inside the screwed cap, as shown in Plate XI. The percussion pellet is a brass casing filled with lead. It fits loosely inside the body. A roughened brass needle is embedded in the lead, so that the top of the casing projects above the point of the needle, and rests against the cap and plug which close the bottom. On the shock of discharge the pellet sets back along the needle, exposing the point; on impact it moves forward with the needle against the detonator, firing the latter and igniting the bursting charge.

Some Mark II 6-pr. steel shell have been issued differing only from Mark III in having the base piece of the shell and the fuze hole screwed 14 threads per inch left hand, and having the Hotchkiss fuze, Mark I, but screwed 14 threads per inch left hand, to suit the shell.

The *Cartridge, Quick-firing, 6-pr. Common Shell, Mark II*, is similar to the *Cartridge, Quick-firing, 6-pr. (Steel) Shell*, but the iron shell used in the *Practice Cartridge* is substituted. It has not the yellow band.

The *Cartridge, Quick-firing, 6-pr., Practice, Mark II*, is composed of cartridge case, felt wad, and iron shell, filled with salt, and plugged with a gunmetal plug, which is similar in external form and dimensions to the fuze employed in the service shell. The shell is painted black, with a yellow band round the centre of the body, and is for practice only. Some 6-pr. practice cartridges have been issued, with iron shell filled and fuzed, and have not the yellow band.

The *Cartridge, Quick-firing, 6-pr., Saluting, Mark II*, consists of a short solid drawn case, similar to the service case cut off below the shoulder. The charge is 15 oz. blank R.L.G.² in a red shalloon cartridge, choked and hooped with six blue worsted braids. It is secured in the case by a thick felt wad shellaced in.

Primer, 6-pr. or 3-pr., Mark III (Plate XII) for Mark III, saluting cartridge, consists of a body or chamber of brass .56 inch long, in which is formed an anvil pierced with three fire bores; a percussion cap is contained in the head, and the lower part of the body is filled with a priming of F.G. powder. The bottom is closed with a paper disc. A brass pin is fixed in the head, which engages in a slot in the recess in the cartridge case, and secures the primer to the case. Two slots are cut in the head, for the reception of the screwdriver used when inserting or removing the primer.

Drill Cartridges.

The *Cartridge, Quick-firing, 6-pr., Dummy Drill, Mark I*, consists of a solid drawn brass case, similar to that for the 6-pr. steel shell. The case contains a wooden block, which reaches to the bottom, the part projecting from the case being turned to the shape of the common shell, but without bands. The block is fixed in the case by three brass screws. Into the base of the case is screwed a hollow cylinder, closed at the inner end by a screw plug, and containing a spiral spring which presses against a pad of india-rubber, the latter receiving the blow of the striker.

Making up and Preparation of Cartridges

The service and practice cartridges are issued made up packed in "boxes, ammunition, Q.F., 6-pr." Marks II or III, 11 in a box. They require no preparation beyond the removal of the clip just before loading.

The saluting ammunition is issued in boxes as follows:—

Ammunition.	For 6-pr.	Remarks.
Cartridges, Q.F., saluting, shalloon ..	50	In case, powder, metal-lined, half. In box, cartridge, Q.F., 6-pr., saluting; cartridge cases. (Mark II.)
" " " case, 6-pr.	20	
" " " wads, paper	125	In box, cartridge, Q.F., 6-pr., saluting; tools. (Mark III.)
" " " wads, felt	125	
" " " primers }	100	
" in cylinders of 20		
Tools, cartridge, Q.F.:—		
Rod, 12.7-inch	1	
Driver, screw, primer	1	

Complete boxes only are issued.

The shalloon cartridge and wad are inserted in the case when required for use.

To re-prime a case, unscrew the primer with the screwdriver, and, if necessary, drive it out by means of the 12·7-inch rod, using a wooden mallet. The case, if serviceable, is then cleaned, and a new primer inserted and screwed home with the screwdriver. The case is then ready for filling.

The 12·7-inch rod is ·5 inch in diameter, reduced for a length of ·65 inch to a diameter of ·17 inch, to suit the hole in base of cartridge case in driving out the primer. The primer should be removed from the cartridge case as soon as possible after firing, to prevent seizure.

Quick-firing cartridge cases after being fired will be immersed as soon as possible in warm fresh water, with a little soda (about 1 lb. to 2 gallons) dissolved in it, and left for two or three hours. They will then be taken out and thoroughly dried; when thoroughly dry they are to be repacked, together with the clips, in the boxes in which they were supplied, and returned into store.

The fired service cartridges are not on any account to be repacked in boxes containing unfired cartridges.

The saluting cases after being dried will be re-primed and replaced in the box; they will not be returned into store, if serviceable.

DRILL FOR 6-PR. HOTCHKISS GUN ON RECOIL OR NON-RECOIL MOUNTING.

The detachment consists of five numbers, and falls in two deep in rear of and facing the gun.

	To Tell Off.	
<u>Officer.</u>		<u>No. 1.</u>
<i>Tell Off.</i>		

At "*Tell off*" No. 1, who is on the left of the detachment, takes a pace to his front, turns to his right and numbers himself 1; the right hand man of the rear rank numbers himself 2; the right hand man of the front rank 3, and so on to the left.

After the detachment is told off, No. 1 falls in again on the left of the front rank.

To Take Post on the Gun.

<u>Officer.</u>		<u>No. 1.</u>
<i>Take post on the gun.</i>		<i>Double march.</i>

Each number doubles to his position in action.

2 halting on the right side of the breech, 3 on the left, facing inwards, 1 in rear of the gun.

4 and 5 in rear with the ammunition.

	Action.	
<u>Officer.</u>		<u>No. 1.</u>
<i>Action.</i>		

1 satisfies himself that the extractor and firing pin are uninjured

and in good working order, that the bore is clear, that the sights work easily, and with Mark II gun, that the buffers are filled with oil.

2, that the breech block and lever work easily.

4 and 5 bring up and open ammunition cases in a convenient position for 3 to serve, and remove safety clips on base of cartridges.

Duties in Action.

1 commands, lays, and fires.

2 opens and closes the breech.

3 loads.

4 and 5 remove safety clips from bases of cartridges and supply ammunition.

To Load.

<i>Officer.</i>	<i>No. 1.</i>
<i>Range — yards*</i>	<i>Load.</i>
<i>(naming & pointing out the object).</i>	
<i>Load.</i>	

1 adjusts the tangent sight to the required elevation and deflection (if any), &c.

2 takes hold of the arms† of the lever with both hands, and forces it smartly downwards to the rear, opening the breech. As soon as 3 has placed the cartridge in the bore, he closes the breech by the reverse action.

3 takes a cartridge from the case, places it into the bore, pressing it hard home.

4 and 5 keep up a supply of ammunition.

To Commence Firing.

<i>Officer.</i>	<i>No. 1.</i>
<i>Commence.</i>	

No. 1 looks over his sights, and, placing his left shoulder against the shoulder-piece, lays by guiding the shoulder-piece with the left hand, places the forefinger of his right hand on the trigger, and fires at his own discretion, keeping the gun bearing on the object.

After firing the other numbers re-load as before.

Cease Firing.

1 discontinues the fire and sets his sights at zero; 2 opens the breech; 3 returns the cartridge, if unfired, to the ammunition box. 2 then closes the breech.

On a Missfire.

<i>No. 1.</i>
<i>Missfire.</i>

After a pause of not less than one minute 2 opens the breech very gently (*see instructions on p. 16*); 3 carefully removes the cartridge, which is to be placed on one side if the cap has been struck. If time admits, as at practice, the cartridge may be tried again.

* Giving nature of projectile.

† Mark II gun has only one arm to the lever, which is worked by No. 2 with his right hand.

If the cap has not been struck it will be necessary to replace the striker by a new one.

To form Detachment Rear.

Officer.

No. 1.

Detachment rear.

Double march.

At "*Detachment rear*" No. 1 doubles to the rear of the gun, facing to the front, and gives—

"*Double march*,"—on this word the numbers double to their places in "*detachment rear*," halting and fronting as they come up.

To Change Rounds.

No. 2 becomes No. 1; 1, 5; 5, 4; 4, 3; 3, 2.

Instructions for Guidance in the Service of the Gun.

If in loading a cartridge jams, and will not let the block close, *never attempt to drive it home by forcing the block*; unload at once, put the cartridge aside, and try another.

If for any reason the cartridge case or cartridge will not extract, catch the head with the "extractor hand" and pull it out. If this fails, ram it out from the muzzle.

If the nib of the extractor breaks, back the stop screw clear of the wedge, lower the block until the extractor slot is clear, pull out the extractor, and insert the spare one. *Do not insert the spare extractor with a cartridge already in the gun*, as the hook will come on the wrong side of the cartridge head.

If the firing pin, main or sear spring breaks, turn out the broken part and put in the spare one.

If a cartridge misses fire at practice, or when firing blank, the breech is to be opened, *very gently, after a pause of not less than one minute* to obviate the danger from a possible hang-fire. See that the drill-hook has been removed. Unload, re-load with a fresh cartridge, and try again. If the missfire is repeated, remove the wedge at once, and feel the firing pin to see if it is broken. If it is not, and everything looks right, change the main spring before putting the block back.

These precautions may not be necessary, but it must be remembered that when under fire no time must be lost in examining cartridges or mechanism; a remedy must be applied at once.

If, after firing, the cartridge case sticks after partial extraction, feel for a burr about the edge of the chamber; careless loading may cause the hard point of the shell to knock up a burr just sufficient to clinch the case on firing. If such exists it must be filed off smooth.

In action, do not try a second time any cartridge that has once failed unless it is absolutely necessary. To do so is an unnecessary experiment, by which a telling shot may be missed.

RANGE TABLE * FOR 6-PR. HOTCHKISS QUICK-FIRING B.L. GUN.

Based on Practice of 22. to 24. 10. 83., 10. and 13. 4. 85, and 9. 7. 85.

Charge—1 lb 15½ oz. C² Sevrin-Livier. Muzzle velocity—1818 f.s.
 gravimetric density: 1.09. Mounting—Cone.
 Projected weight, 6 lbs. Time—Four minutes negative.

Range.	Eleva- tion.	Angle of descent.	Slope of descent.	To hit an object lb feet high, range must be known within	Remain- ing velocity.	Penetra- tion, wrought iron.	50 per cent. of rounds should fall within		
							Length.	Breadth.	Height.
yards.	° ' "	° ' "	1 in.	yards.	f.s.	inches.	yards.	yards.	feet.
0	—	—	—	—	1818	4.6	—	—	—
100	0 9	0 5	687	1146	1756	4.4	34	0.1	0.2
200	0 14	0 11	312	521	1696	4.2	33	0.1	0.4
300	0 20	0 18	191	318	1637	4.0	32	0.2	0.5
400	0 26	0 25	138	229	1579	3.9	32	0.3	0.7
500	0 32	0 32	107	179	1521	3.8	31	0.3	0.9
600	0 38	0 40	86	143	1466	3.6	31	0.4	1.1
700	0 45	0 49	70	117	1414	3.4	30	0.5	1.3
800	0 52	0 58	59	99	1361	3.3	30	0.5	1.6
900	1 0	1 8	51	84	1316	3.2	30	0.6	1.8
1000	1 8	1 19	44	72	1269	3.1	29	0.6	2.0
1100	1 17	1 31	38	63	1229	3.0	29	0.7	2.3
1200	1 26	1 43	33	55	1192	2.9	29	0.7	2.6
1300	1 35	1 56	29	49	1155	2.8	29	0.8	3.0
1400	1 45	2 11	26	44	1118	2.7	28	0.9	3.3
1500	1 55	2 27	23	39	1082	2.6	28	1.0	3.7
1600	2 5	2 44	21	35	1060	2.5	28	1.1	4.1
1700	2 16	3 2	19	31	1040	2.4	28	1.2	4.5
1800	2 27	3 21	17	28	1019	2.3	28	1.3	5.0
1900	2 38	3 41	16	26	996	2.3	28	1.4	5.5
2000	2 50	4 2	14	24	974	2.3	28	1.5	6.0
2100	3 2	4 24	13	22	957	2.2	28	1.7	6.5
2200	3 14	4 46	12	20	941	2.2	28	1.8	7.1
2300	3 27	5 9	11	18	925	2.2	29	1.9	7.7
2400	3 40	5 33	10	17	909	2.2	29	2.1	8.3
2500	3 53	5 57	9.6	16	893	2.1	29	2.2	9.0
2600	4 6	6 22	9.0	15	879	2.0	29	2.4	9.8
2700	4 20	6 47	8.4	14	865	2.0	30	2.5	11
2800	4 34	7 13	7.9	13	851	2.0	30	2.7	11
2900	4 48	7 40	7.4	12	837	2.0	30	2.8	12
3000	5 2	8 7	7.0	12	824	1.9	30	3.0	13
3100	5 17	8 35	6.6	11	811	1.9	31	3.2	14
3200	5 32	9 5	6.3	10	799	1.9	31	3.3	15
3300	5 48	9 37	5.9	10	787	1.8	31	3.5	16
3400	6 4	10 11	5.6	9	775	1.8	31	3.7	17
3500	6 21	10 47	5.3	9	763	1.8	32	3.9	18
3600	6 39	11 26	4.9	8	752	1.7	32	4.1	19
3700	6 57	12 7	4.6	8	741	1.7	32	4.4	21
3800	7 16	12 50	4.4	7	730	1.7	32	4.6	22
3900	7 36	13 34	4.1	7	719	1.7	33	4.8	24
4000	7 57	14 19	3.9	7	708	1.7	33	5.0	25
4100	8 19	15 6	3.7	6	697	1.6	—	—	—
4200	8 41	15 54	3.5	6	687	1.6	—	—	—
4300	9 4	16 42	3.3	6	677	1.6	—	—	—
4400	9 28	17 31	3.2	5	667	1.6	—	—	—
4500	9 53	18 21	3.0	5	657	1.6	—	—	—

* This table is suitable for the 1 lb. 15 oz. Q.F.¹ charge, which gives the same muzzle velocity.

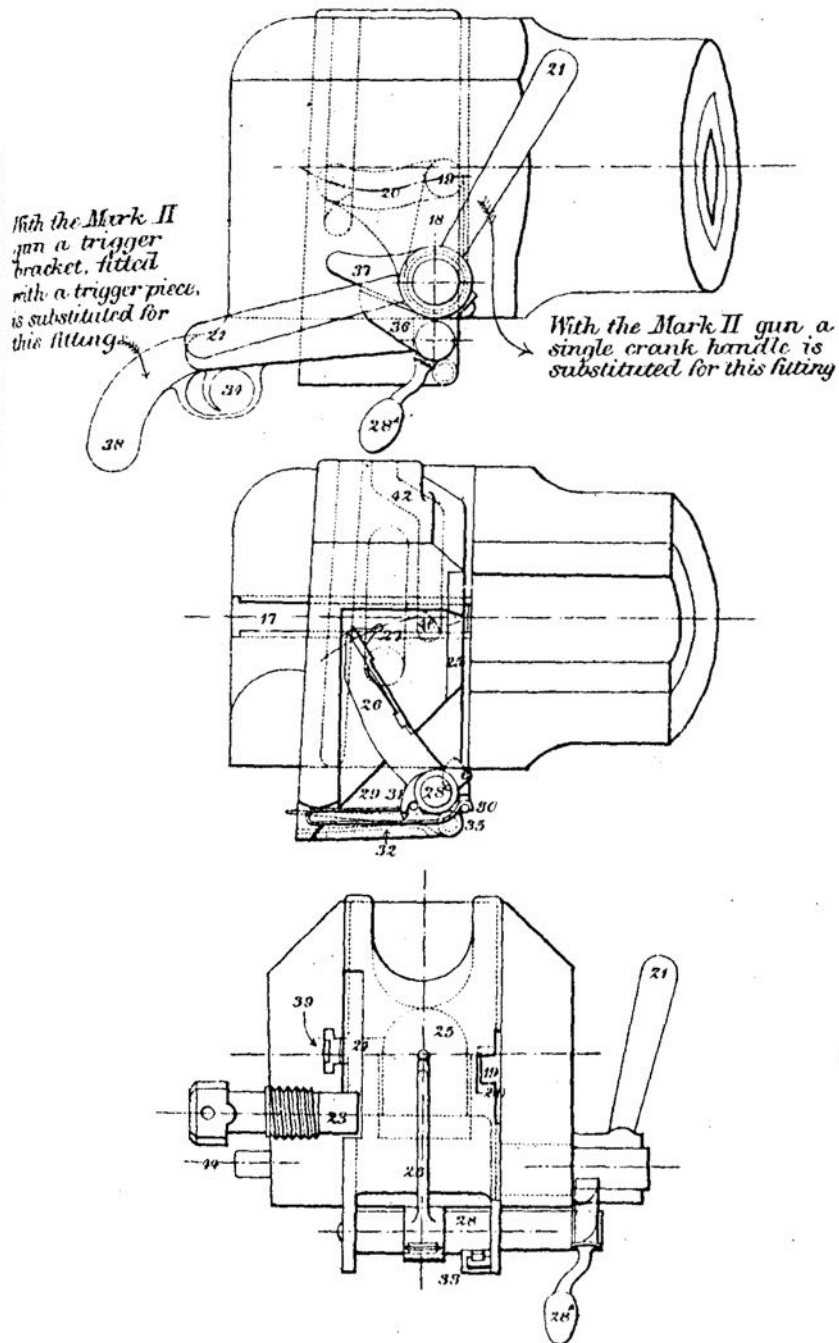
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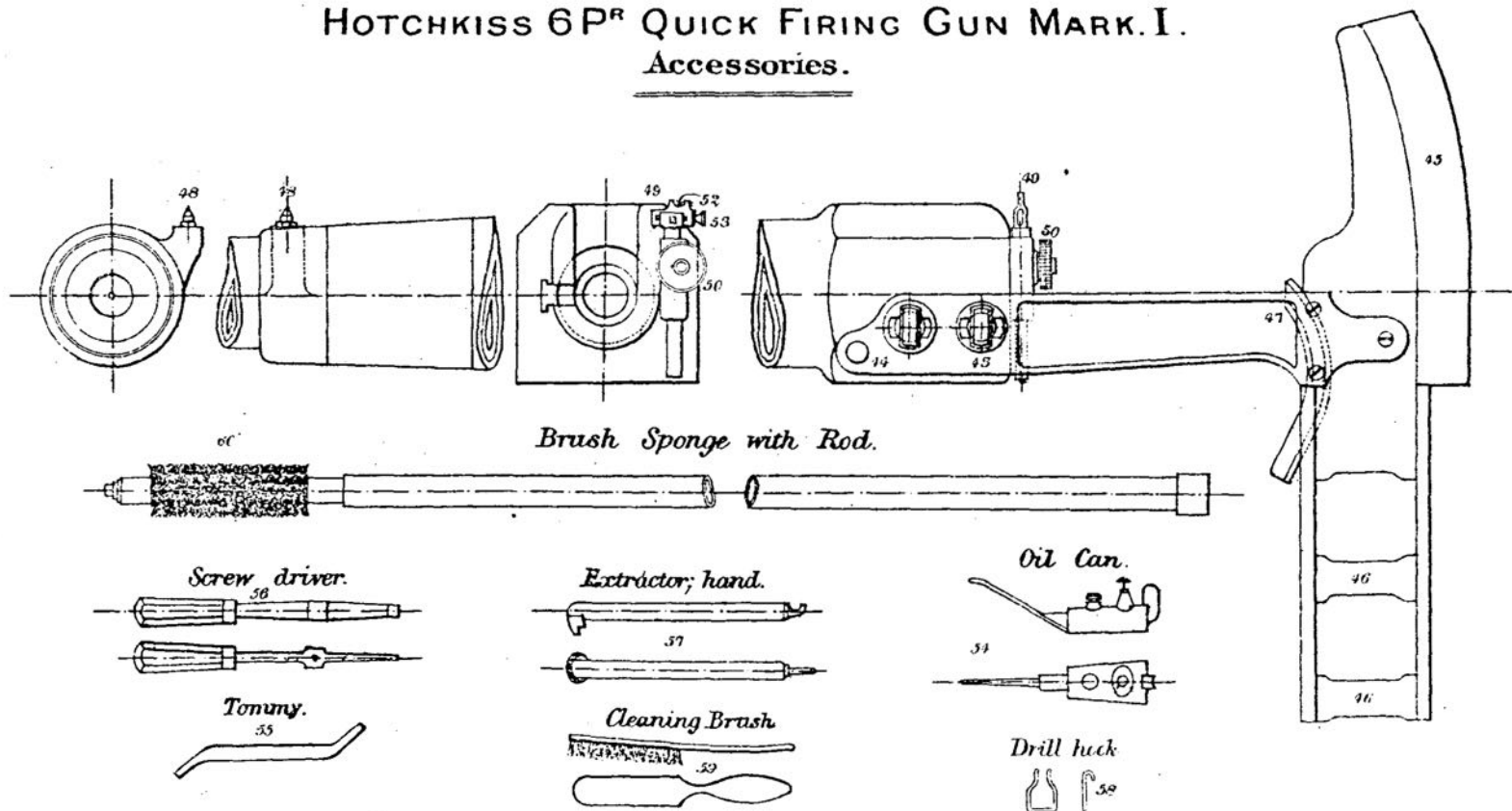
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HOTCHKISS 6 P^R QUICK FIRING GUN MARK. I & II.

Breech Mechanism.



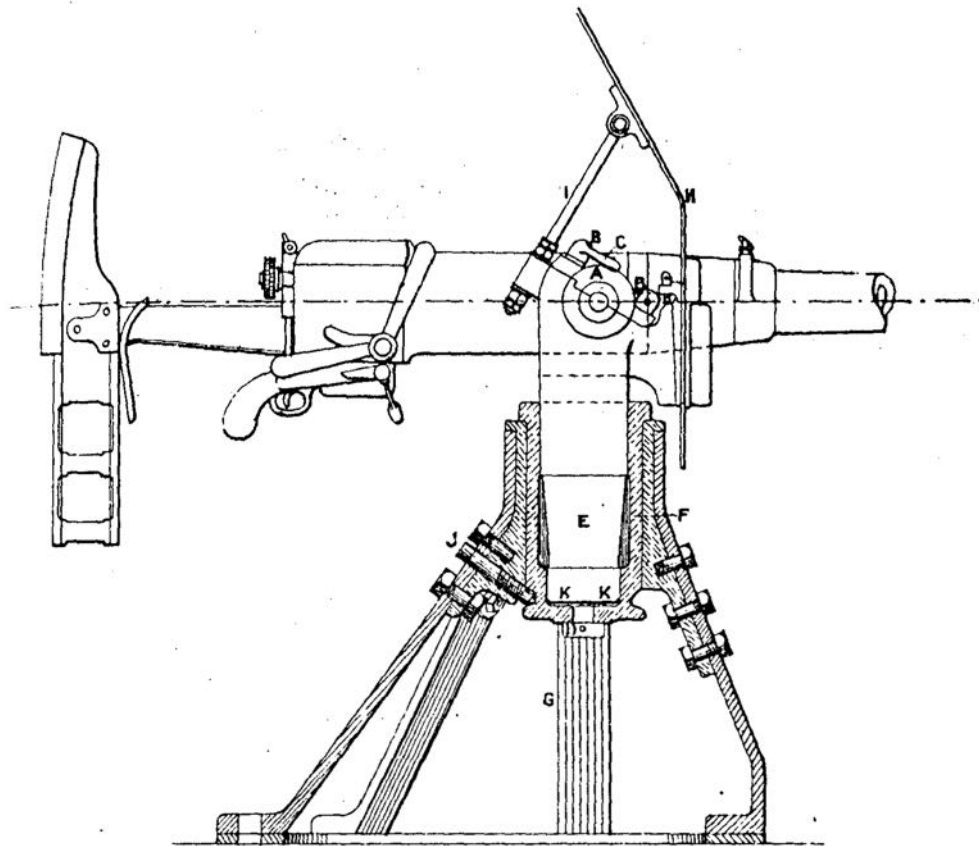
HOTCHKISS 6P^R QUICK FIRING GUN MARK. I. Accessories.



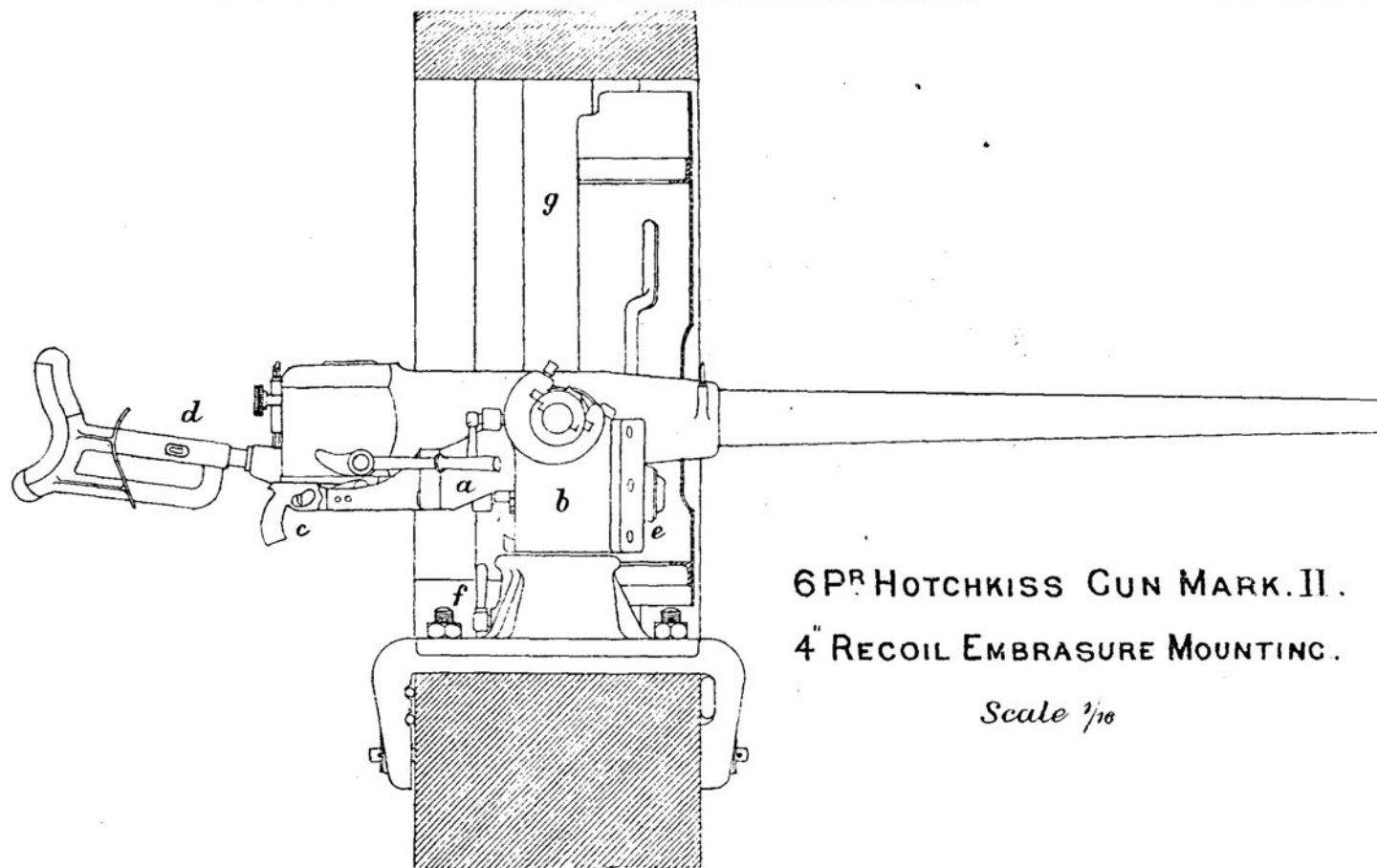
ORDNANCE QUICKFIRING

PIVOT & SOCKET HOTCHKISS 6-PR MARK I.
ELASTIC STAND WITH SHIELD.

23 Guns for L.S. fitted thus & issued to Coaling Stations.

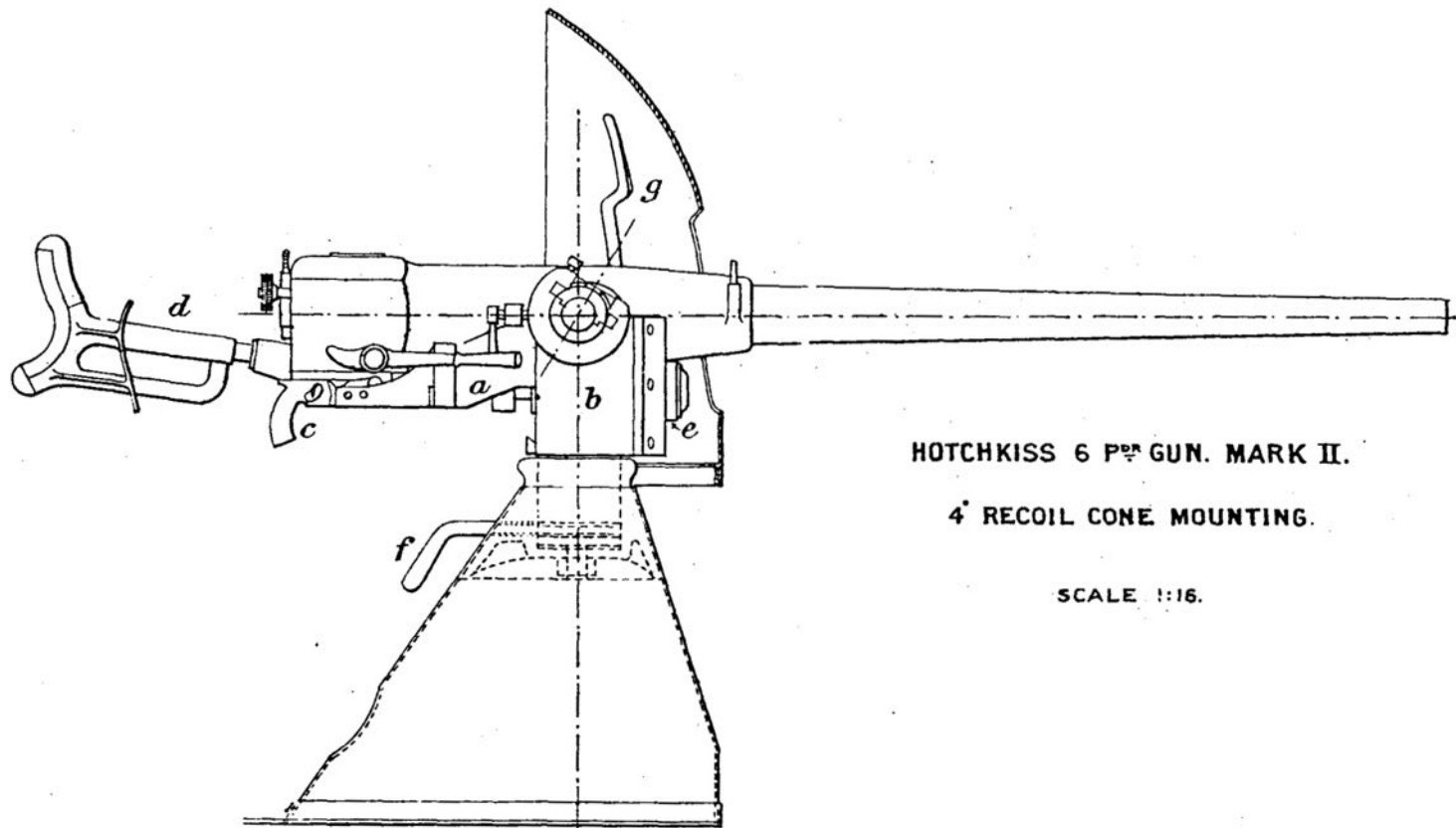


ELEVATION.



6PR HOTCHKISS GUN MARK. II.
4" RECOIL EMBRASURE MOUNTING.

Scale $\frac{1}{16}$

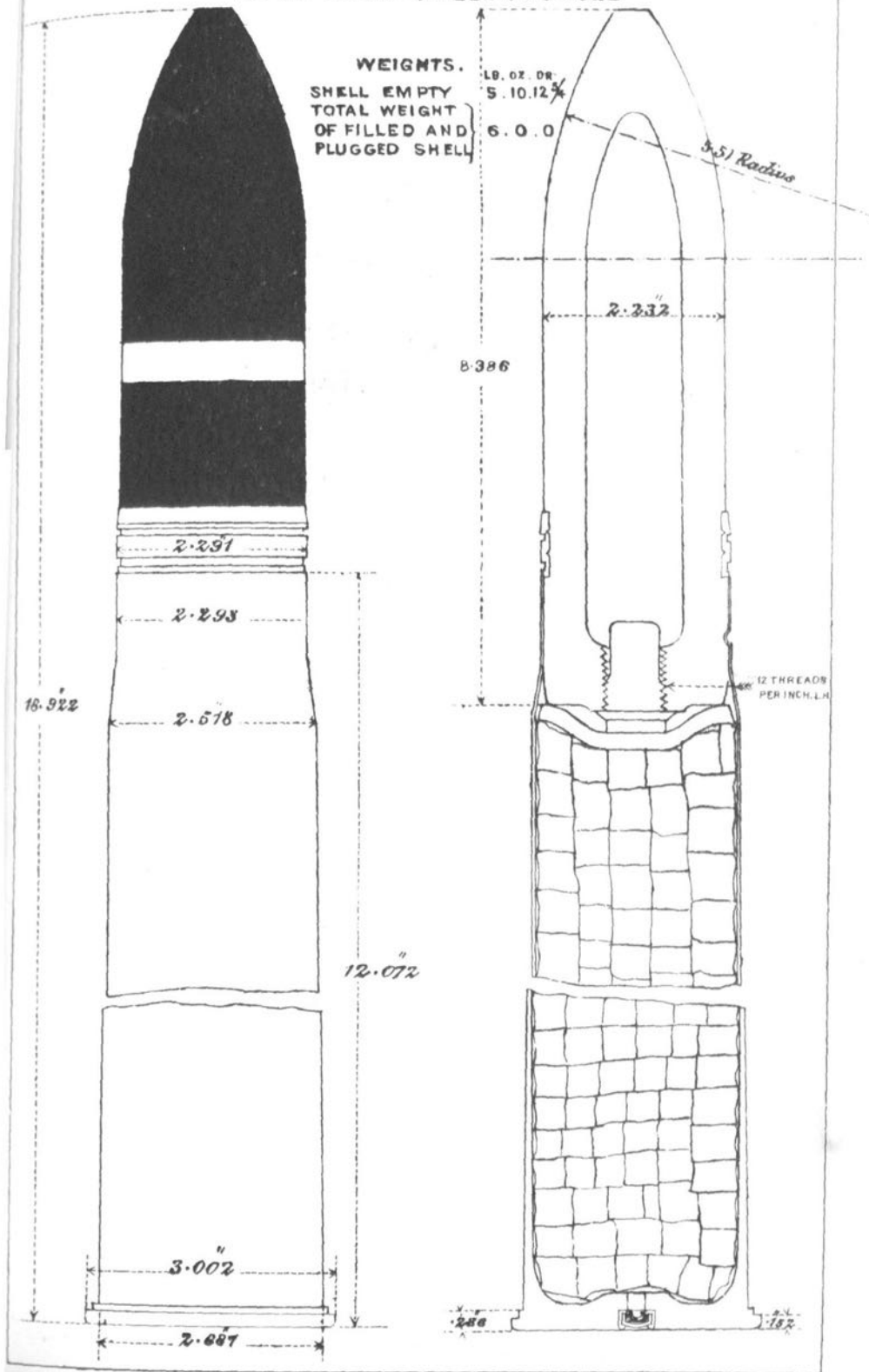


HOTCHKISS 6 P^{DR} GUN. MARK II.

4" RECOIL CONE MOUNTING.

SCALE 1:16.

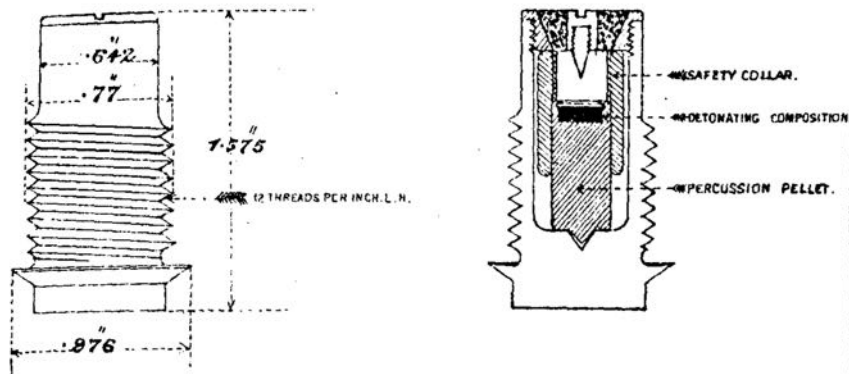
CARTRIDGE QUICK FIRING 6 PR PRACTICE MARK II. WITH IRON SHELL PLUGGED



FUZE PERCUSSION BASE 3 P^R OR 6 P^R

Q. F. NORDENFELT.

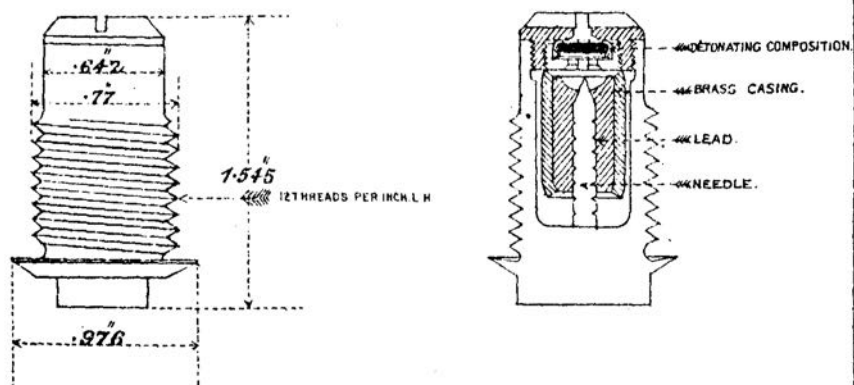
FULL SIZE.



FUZE, PERCUSSION, BASE, HOTCHKISS (MARK II)

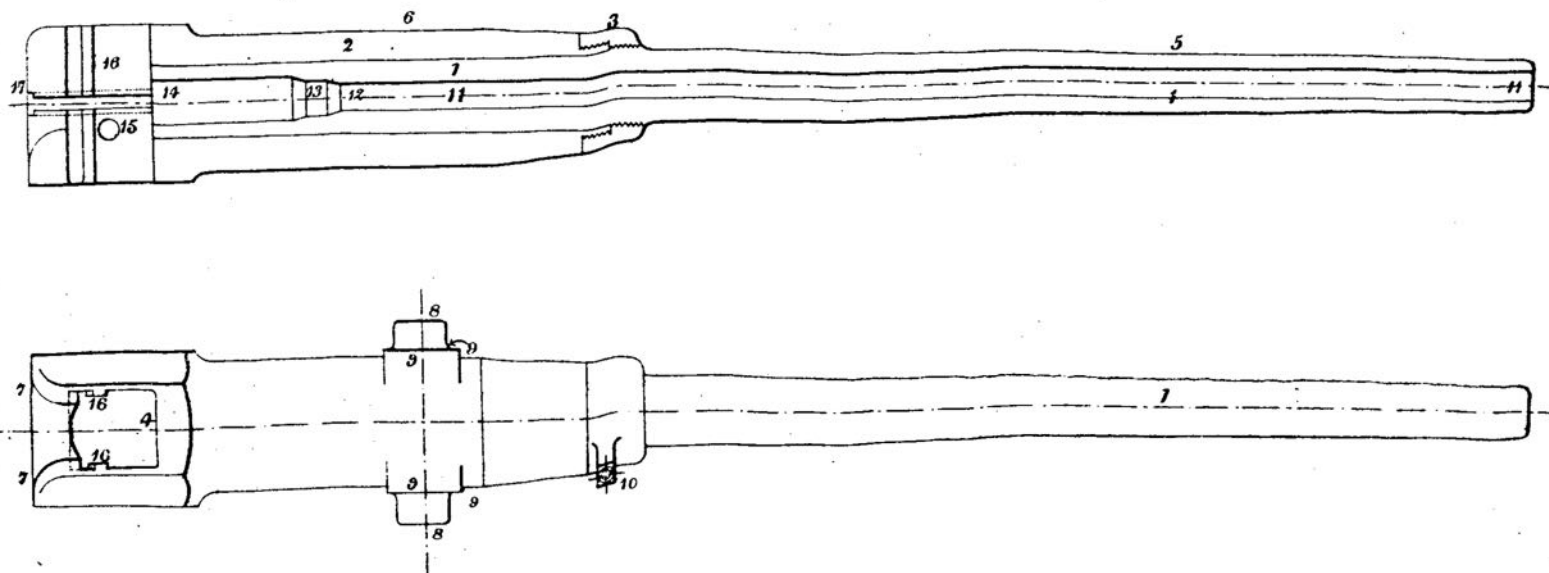
FOR 3 P^R AND 6 P^R Q. FIRING SHELL.

FULL SIZE.



HOTCHKISS QUICK FIRING GUN.

Body of Gun.



Judd & Co. Lith. 73 & 75, Farringdon Rd & Doctors Commons. 1297. 6. 90.

HOTCHKISS 6 PR QUICK FIRING GUN. MARK. I.

Fig. 1.

TRIGGER-SEAR SPRING.

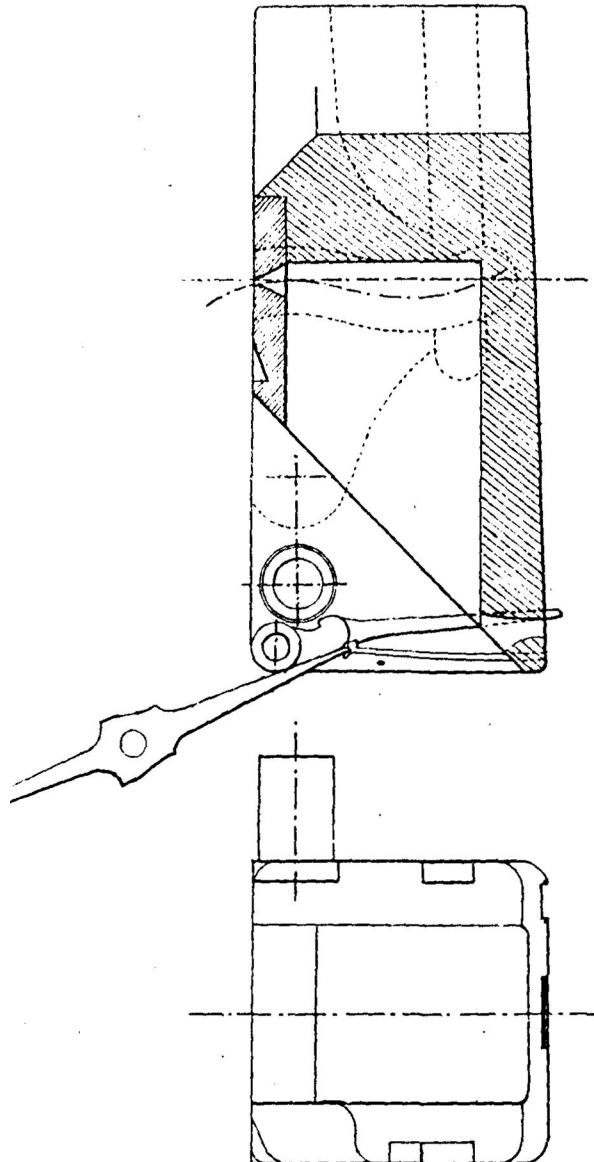


Fig. 2.

MAIN SPRING.

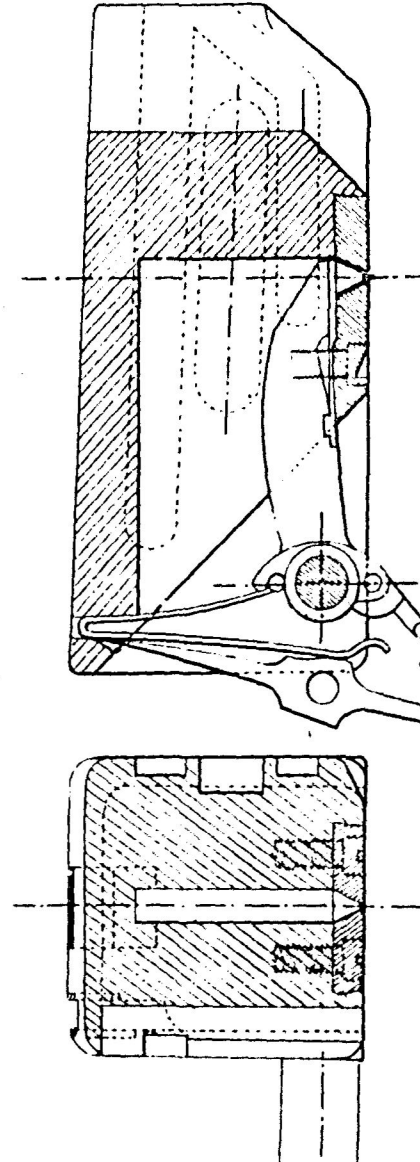
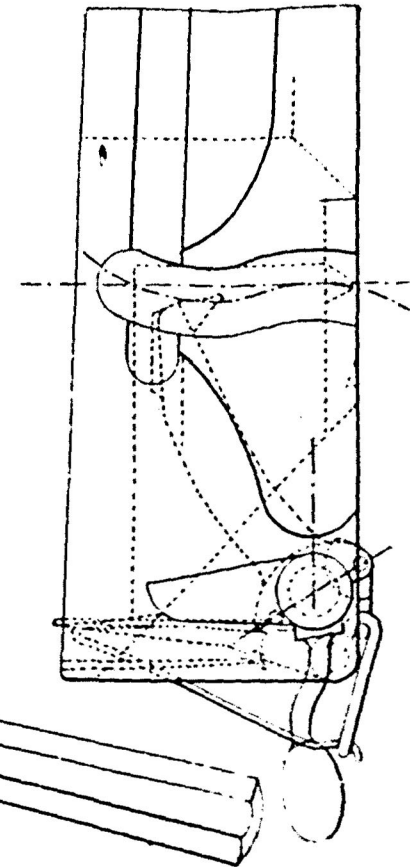
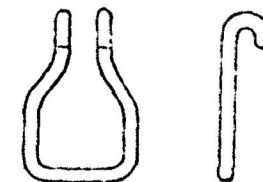


Fig. 3.

DRILL HOOK MOUNTED.



DRILL HOOK.



12

22/5

LB. OZ. DRS
5.9.12 $\frac{3}{4}$
0.4.0
6.0.0

6.565 Bond.

12 THREADS
PER INCH LH

12.072

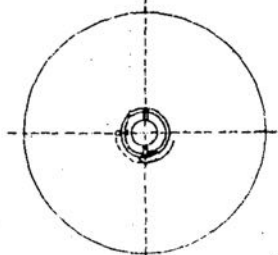
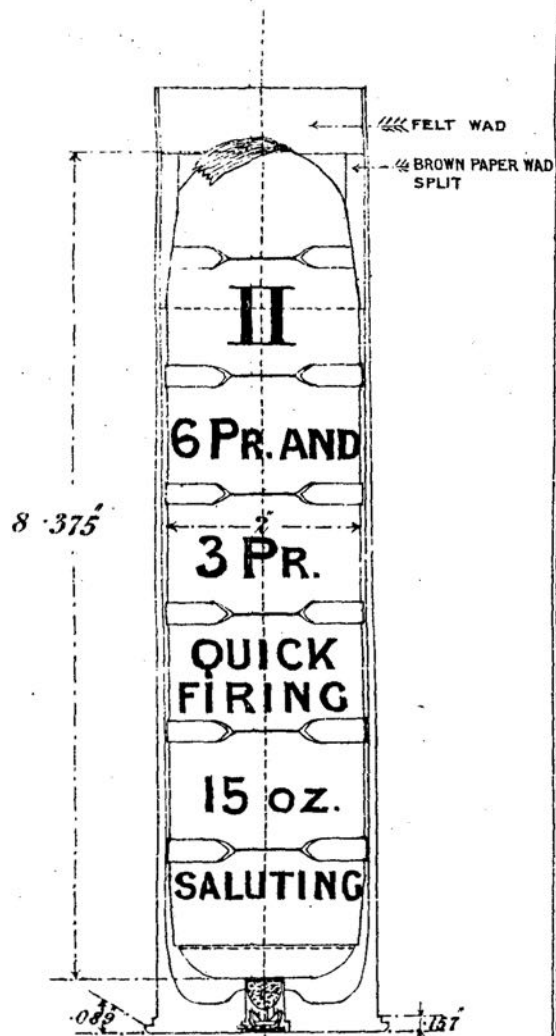
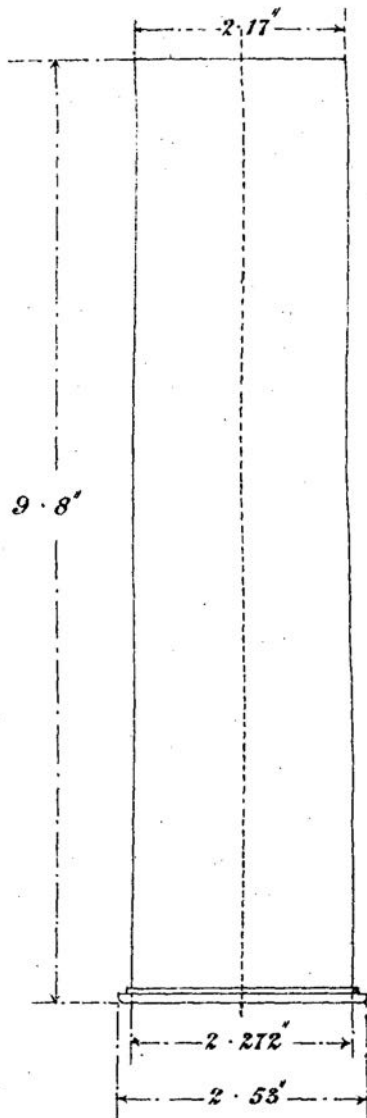
Judd & Co Ltd Lith 73 & 75, Farringdon Rd & Doctors Commons. *TE 07.6/80.*

182

CARTRIDGE QUICK FIRING SALUTING 6 PR MARK III.

15 OZ BLANK L C WITH REMOVABLE PRIMER.

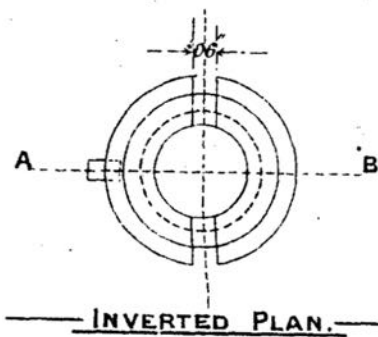
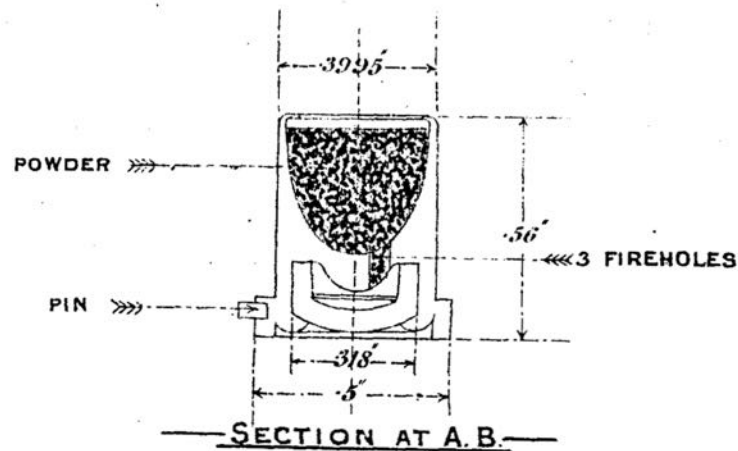
Scale $\frac{1}{2}$:



PLAN OF BASE

CARTRIDGE Q. F. SALUTING:-
PRIMER 6 OR 3 PR MARK III.
WITH CAP, FOR MARK III CASE.

Twice Full Size.



Curves of Penetration for unbacked steel plates.

